BWP-12-19

Paper II	(Objective Type)	Inter -A- 2019	Session (2015 -17) to (2017 - 19)
Time :	30 Minutes	Inter (Part II)	
Marks :	20		

Note : Four possible choices A , B , C ,D to each question are given. Which choice is correct fill that circle in front of that Question No. Use Marker or Pen to fill the circles. Cutting or filling two or more circles will result in Zero Mark in that Question.

1 Projection of $\vec{u} = a\underline{i} + b\underline{j} + c\underline{k}$ along $\underline{i}$ is : (A) b (B) a (C) c (D) a + b

$\underline{K} \times \underline{i}$ equals : (A) $\underline{j}$ (B) $\underline{k}$ (C) 1 (D) 0

Slope of tangent to parabola $y^2 = 4ax$ at (a , 2a) is : (A) 3 (B) 2 (C) -1 (D) 1

Focus of the Parabola $x^2 = 4ay$ is : (A) (a , 0) (B) (- a , 0) (C) (0 , a) (D) (0 , - a)

The length of diameter of the circle $x^2 + y^2 - 4x - 12 = 0$ is : (A) 6 (B) 7 (C) 8 (D) 9

The Graph of the Inequality $ax + by < c$ is :
(A) Circle (B) Parabola (C) Straight Line (D) Half Plane

The perpendicular distance of the line $3x + 4y + 5 = 0$ from the origin is :
(A) 0 (B) 1 (C) 2 (D) 5

Equation of the line having slope -5 and y - intercept -7 is :
(A) $5x + y + 7 = 0$ (B) $5x - y + 7 = 0$ (C) $5x + y - 7 = 0$ (D) $7x + y + 5 = 0$

When a line intersects the y – axis at (0 , 4) then y – intercept is :
(A) 4 (B) 2 (C) 0 (D) 6

Slope of the Line Perpendicular to line $2x - 3y + 1 = 0$ is equal to :
(A) $\frac{3}{2}$ (B) $-\frac{3}{2}$ (C) $\frac{2}{3}$ (D) $-\frac{2}{3}$

Solution of Differential Equation $\frac{dy}{dx} = \text{Sec}^2 x$ is :
(A) $y = \text{Cot}\,x + c$ (B) $y = \tan x + c$ (C) $y = \text{Cos}\,x + c$ (D) $y = -\tan x + c$

If $\int_2^K 2\,dx = 12$, then K = ? : (A) 12 (B) 16 (C) 8 (D) 4

$\int \frac{dx}{\sqrt{5 - x^2}} =$: (A) $\text{Sin}^{-1}\frac{5}{x}$ (B) $\sin^{-1}\frac{x}{\sqrt{5}}$ (C) $\text{Sin}^{-1}\frac{x}{5}$ (D) $\sin^{-1}\frac{\sqrt{5}}{x}$

$\int \text{Sec}^2 x \tan x\,dx =$
(A) $\text{Sec}\,x \tan^2 x + c$ (B) $\frac{Sec^3 x}{3} + c$ (C) $\frac{Sec^3 x \tan x}{3} + c$ (D) $\frac{\tan^2 x}{2} + c$

If $y = \ln e^x$, then $\frac{dy}{dx} =$: (A) e^x (B) $\frac{1}{e^x}$ (C) 1 (D) e^{x-1}

The Derivative of x^3 w.r.t. x^2 is equal to : (A) $\frac{3x^2}{2}$ (B) $\frac{3x}{2}$ (C) $\frac{2}{3x}$ (D) $\frac{2}{3x^2}$

$\frac{d}{dx}(2x^2 + 3)^5 =$
(A) $(2x^2 + 3)^4\, 20x$ (B) $20(2x^2 + 3)^5$ (C) $15(2x^2 + 3)^5$ (D) $(2x^2 + 3)^5\, 100x$

Which one is Leibniz Notation for Derivative of f (x) :
(A) $\frac{df}{dx}$ (B) $f'(x)$ (C) $\frac{d}{dx}$ (D) D f (x)

$\lim_{x \to -1} \frac{x^3 - x}{x + 1} =$: (A) 0 (B) ∞ (C) 2 (D) 1

If P is perimeter of square and A is area then P = :
(A) $2\sqrt{A}$ (B) 4 A (C) $4\sqrt{A}$ (D) A^2

BWP-12-19

Mathematics (Subjective)	Inter - A -2019	Time 2 : 30 Hours	Marks : 80

Note : It is compulsory to attempt any (8 - 8) Parts each from Q.No. 2 and Q.No.3 while attempt any (9) Parts from Q.No.4. Attempt any (3) Questions from Part - II .Write same Question No. and its Part No. as given in the Question Paper.

Part - I

25 x 2 = 50

Q.No.2

(i) Express the area 'A' of a circle as a function of its circumference 'C'.

(ii) Define Odd Function and give an example.

(iii) Prove that $\lim_{x \to 0} \frac{\sqrt{x+a} - \sqrt{a}}{x} = \frac{1}{2\sqrt{a}}$

(iv) Find the derivative of $f(x) = c$ by definition.

(v) If $y = x^4 + 2x^2 + 2$ prove that $\frac{dy}{dx} = 4x\sqrt{y-1}$

(vi) Find $\frac{dy}{dx}$ if $y = \sqrt{x + \sqrt{x}}$

(vii) Differentiate $\cos^{-1}\frac{x}{a}$ w.r.t. 'x'.

(viii) Differentiate $x^2 \operatorname{Sec} 4x$ w.r.t. 'x'.

(ix) Find $\frac{dy}{dx}$ if $y = a^{\sqrt{x}}$

(x) Find y_2 if $y = 2x^5 - 3x^4 + 4x^3 + x - 2$

(xi) Find $\frac{dy}{dx}$ if $y = x\,e^{\sin x}$

(xii) Find $\frac{dy}{dx}$ if $y = \frac{x}{\ln x}$

Q.No.3

(i) Find δy and dy if $y = \sqrt{x}$ when x changes from 4 to 4.41

(ii) Find the area above the x - axis and under the curve $y = 5 - x^2$ from $x = -1$ to $x = 2$

(iii) Graph the solution set of linear inequality $2x + 1 \geq 0$ in xy - plane.

(iv) Using differentials find $\frac{dy}{dx}$ and $\frac{dx}{dy}$ if $xy + x = 4$

(v) Define the Definite Integral.

(vi) Solve the differential equation $ydx + xdy = 0$

(vii) Evaluate $\int \frac{\cos x}{\sin x \ln \sin x} dx$

(viii) Evaluate $\int x \ln x \, dx$

(ix) Define Corner Point of Solution Region.

(x) Evaluate $\int \sec^4 x \, dx$

(xi) Evaluate $\int_{-2}^{0} \frac{1}{(2x-1)^2} dx$

(xii) Solve $\frac{dy}{dx} = \frac{y^2+1}{e^{-x}}$

Q.No.4

(i) Show that the points $A(0,2)$, $B(\sqrt{3},-1)$ and $C(0,-2)$ are vertices of a right triangle.

(ii) Find equation of the line through $(-4,7)$ and parallel to $2x - 7y + 4 = 0$

(iii) Find angle from line with slope $\frac{-7}{3}$ to line with slope $\frac{5}{2}$

(iv) Find length of tangent from the point $P(-5,10)$ to circle $5x^2 + 5y^2 + 14x + 12y - 10 = 0$

(v) Find Vertex of Parabola $(x-1)^2 = 8(y+2)$

(vi) Find Equation of Hyperbola with Foci $(\pm 4, 0)$, Vertices $(\pm 2, 0)$.

(vii) If $\overrightarrow{AB} = \overrightarrow{CD}$, find A if $B(1,2)$, $C(-2,5)$, $D(4,11)$ are given points.

(viii) If $\underline{u} = \alpha\underline{i} + 2\alpha\underline{j} - \underline{k}$, $\underline{v} = \underline{i} + \alpha\underline{j} + 3\underline{k}$ are perpendicular vectors, find value of α.

(ix) Find vector perpendicular to each of vectors $\underline{a} = 2\underline{i} + \underline{j} + \underline{k}$, $\underline{b} = 4\underline{i} + 2\underline{j} - \underline{k}$

(x) Find volume of parallelepiped determined by :

$\underline{u} = \underline{i} + 2\underline{j} - \underline{k}$, $\underline{v} = \underline{i} - 2\underline{j} + 3\underline{k}$, $\underline{w} = \underline{i} - 7\underline{j} - 4\underline{k}$

(xi) Define Trapezium.

(xii) Define Ellipse.

(xiii) Define Directional Angles.

P.T.O.

BWP- 12 - 19

.No.1319

(Part – II)

.5	(a)	Discuss the continuity of $f(x)$ at $x = 2$ $$f(x) = \begin{cases} x^2 - 1 & x < 2 \\ 3 & x \geq 2 \end{cases}$$	(5)
	(b)	Discuss the function $f(x) = \sin x + \frac{1}{2\sqrt{2}} \cos 2x$ for extreme values in the interval $(0, 2\pi)$	(5)
o.6	(a)	Evaluate the Integral $\int \frac{2x^2}{(x-1)^2 (x+1)} dx$	(5)
	(b)	Find the point three – fifth of the way along the line segment from A(-5, 8) to B(5, 3)	(5)
lo.7	(a)	Solve the differential equation $\frac{dy}{dx} + \frac{2xy}{2y+1} = x$	(5)
	(b)	Minimize $z = 3x + y$ Subject to the constraints $3x + 5y \geq 15$ $x + 6y \geq 9$ $x \geq 0, \ y \geq 0$	(5)
No.8	(a)	Find a joint equation of the lines through the origin and perpendicular to the lines $x^2 - 2xy \tan\alpha - y^2 = 0$	(5)
	(b)	Find equation of the circle of radius 2 and tangent to the line $x - y - 4 = 0$ at A(1, -3)	(5)
No.9	(a)	Find the Centre, Foci, Eccentricity, Vertices and equations of diretrices of : $$\frac{x^2}{4} - \frac{y^2}{9} = 1$$	(5)
	(b)	Find a Unit Vector Perpendicular to the plane containing vectors $\underline{a} = 2\underline{i} - 6\underline{j} - 3\underline{k}$ and $\underline{b} = 4\underline{i} + 3\underline{j} - \underline{k}$ Also find Sine of the angle between them.	(5)

09-04-2019